

REMARKS

Claims 1-16 and 18-20, as amended, as well as new claims 21-26 are pending for the Examiner's review and consideration. Applicant appreciates the courtesies extended by Examiner Necholus Ogden during an interview on October 6, 2005 with Applicant, Richard Middleton, and Applicant's representatives, Jeffrey A. Wolfson and Jovial Wong. The comments appearing herein are substantially in accord with those presented and discussed during the interview.

Initially, the specification has been amended at paragraph [0043] to correct a minor typographical error. Claim 1 has been amended to recite that the cleaning fluid consists essentially of n-propyl bromide ("n-PB"), and further separating an amount of the cleaning fluid and a portion of extraneous substances from each cleaned textile absorber. *See, e.g.*, specification at ¶¶ [0024] and [0032]. Claim 13 has been amended to recite further separating a first cleaning fluid portion and a first portion of extraneous substances from each dry cleaned textile absorber. *Id.* The pending claims have also been amended to more clearly and distinctly recite the invention.

New claim 21 recites a preferred embodiment where the cleaning fluid consists of n-PB. *See, e.g.*, specification at ¶ [0032]. New claim 22 recites that each textile absorber comprises clothing and the cleaning comprises dry cleaning. *See, e.g.*, specification at ¶¶ [0022] and [0033]. New claim 23 recites that the extraneous substances comprise one or more of dirt, dust, particulates, oils, grease, coolants, glycol or other solvents. *See, e.g.*, specification at ¶ [0002]. New claim 24 recites a method for removing extraneous substances from textile absorbers, which includes storing at ambient temperature a cleaning fluid comprising n-PB and cleaning each textile absorber with the cleaning fluid. *See, e.g.*, specification at ¶¶ [0039] and [0040]. New claim 25 recites a method for removing extraneous substances from textile absorbers, which includes containing a cleaning fluid comprising n-PB in a closed vessel, circulating the cleaning fluid through a closed loop cleaning system so that a portion of the cleaning fluid contacts each textile absorber in a dry cleaning zone, and dry cleaning each textile absorber in the zone, wherein the closed loop cleaning system includes at least one pneumatic device that comprises stainless steel. *See, e.g.*, specification at ¶¶ [0014] and [0041]. New claim 26 recites an embodiment where the pneumatic device is a ball valve including at least one stainless steel ball. *See, e.g.*,

specification at ¶ [0041]. No new matter has been added as a result of these amendments, as well as the addition of new claims 21-26, which are all fully supported in the originally filed specification.

Initially, it might be useful to discuss the Applicant's invention. Applicant submits herewith the Second Declaration of Richard G. Middleton Under 37 C.F.R. § 1.132 ("Second Middleton Declaration") in support of the patentability of the pending claims. The invention is generally directed to removing undesired extraneous substances from textile absorbers, *e.g.*, clothes, rags, shop towels, absorbent industrial socks and booms, *etc.* with a cleaning fluid that includes n-PB. In one preferred embodiment, the cleaning fluid includes n-PB essentially free of hazardous materials that are typically added as stabilizers to commercially available n-PB. *See, e.g.*, Second Middleton Declaration at ¶5. The claimed methods using n-PB as a cleaning fluid provide many surprising and unexpected benefits in dry cleaning applications, as compared to the traditionally-used perchloroethylene ("PERC"). *Id.* Such advantages include the fact that the use of n-PB as claimed is non-hazardous as recognized by the U.S. Environmental Protection Agency ("EPA"), more effective at separating oil and grease from textile absorbers, and results in the textile absorbers having a fresher scent and softer feel. *Id.* Additionally, n-PB can be stored in a dry cleaning device at ambient temperatures without undue evaporation, and the amount of shrinkage observed in the cleaned materials is reduced due to the decreased drying time and temperatures that can be achieved when using n-PB as a cleaning fluid. *Id.*

Claims 1-20 were rejected under 35 U.S.C. § 103(a) as being obvious over Applicant's own U.S. Patent No. 6,230,353 to Middleton ("the '353 patent"), in view of European Application EP1300501 to Carnovale ("Carnovale") on page 5 of the Office Action. The Patent Office position is allegedly that, based on the methods of the '353 patent, it would have been obvious to use n-PB in the '353 patent methods based on the teachings of Carnovale.

Claim 1 recites cleaning at least one textile absorber in a cleaning fluid that consists essentially of n-PB to remove a portion of the extraneous substances from each textile absorber. The '353 patent is directed to a method for separating oil from oil-absorbent materials, including placing the oil-absorbent materials on a grid and centrifuging the materials to remove extraneous substances therefrom, such as oils, grit, dirt, and metal chips

and shavings. *See, e.g.*, Col. 3, lines 17-33. The oil-absorbent materials are then dry cleaned in a double distilled dry cleaning fluid, such as perchloroethylene ("PERC"), to remove additional oils and remaining substances from the materials. *See, e.g.*, Col. 4, lines 8-14. The '353 patent does not remotely suggest n-PB, much less the need to find any new dry cleaning solvents other than those that were already commercially available. *See, e.g.*, Second Middleton Declaration at ¶¶ 6 and 10.

Carnovale is directed to a drying circuit for dry cleaning machines using commercially available n-PB as a solvent, where the vapor pressure of the n-PB has negligible values. *See, e.g.*, Carnovale at ¶ [0012]. In particular, Carnovale teaches immersing a metal cooling coil in a solvent holding tank including the n-PB, which is kept at a temperature between 0 °C and -20 °C. This allegedly causes the vapor pressure of the n-PB to be kept at low levels to limit the evaporation of n-PB while in the solvent tank. *See, e.g.*, Carnovale at ¶¶ [0014] and [0022].

No motivation existed for one of ordinary skill in the art to use the dry cleaning with n-PB allegedly taught by Carnovale with the cleaning method of the '353 patent. *See, e.g.*, Second Middleton Declaration at ¶ 10. For example, the PERC cleaning fluid of the '353 patent was—and is—significantly less expensive than n-PB, such that there was a teaching away from using a much more expensive material that is lost over time through the dry cleaning process. *Id.*

Moreover, no reasonable expectation of success existed to achieve the method presently recited, *e.g.*, in claim 1, which recites the use of a cleaning fluid that consists essentially of n-propyl bromide. In fact, Carnovale teaches the use of commercially available n-PB, such as Comexol One marketed by Comeco 2. *See, e.g.*, Carnovale at ¶ [0008]. Commercially available n-PB, however, typically includes stabilizers that are added thereto to help stabilize the chemical composition during use thereof. Because these stabilizers include hazardous materials, the use of commercially available n-PB containing these stabilizers is regulated by the EPA, which requires proper permits, disposal, and treatment of the chemicals as hazardous substances. *See, e.g.*, Second Middleton Declaration at ¶ 12.

No motivation existed, and indeed there would not have been any reasonable expectation of success based on the cited references, for one of ordinary skill in the art to have removed the hazardous stabilizers from commercially available n-PB formulations to

provide a cleaning fluid that consists essentially of n-PB and to use such a cleaning fluid in the recited method. It was only through Applicant's experimentation that Applicant requested that hazardous n-PB stabilizers be excluded from commercially available n-PB being sold for use in degreasing, metal cleaning, and solvents for carriers. *See, e.g.*, Second Middleton Declaration at ¶¶ 12 and 13. Moreover, Applicant discovered the surprising and unexpected benefits of using such a formulation as a cleaning fluid. Such benefits of the claimed invention include the discovery that cleaning fluids including n-PB could be operably used and reused in the cleaning process without such hazardous stabilizers, thus avoiding the costs and complexities associated with disposal and treatment of the stabilizers as hazardous substances. *See, e.g.*, Second Middleton Declaration at ¶ 13. Therefore, the use of a cleaning fluid consisting essentially of n-PB as recited in claim 1 could not have been obvious over the '353 patent in view of Carnovale, even if a motivation to combine then existed. For similar reasons, claims 20-21 which also recite that the cleaning fluid consists essentially of, or consists of, n-PB, are also patentable over the '353 patent even in combination with Carnovale.

Moreover, despite the assertion in the Office Action, the use of commercially available n-PB as a dry cleaning solvent is not well known in the art, and even if it was described in certain references, these did not provide motivation or a reasonable expectation of success in actually doing so according to the claimed invention. To the best of Applicant's knowledge, no commercially available dry cleaning equipment or methods exist that use n-propyl bromide as a dry cleaning fluid. *See, e.g.*, Second Middleton Declaration at ¶ 5. Applicant was completely unaware of this material or its properties until he conducted experimentation and discovered its beneficial use in dry cleaning applications after his '353 patent was filed. *Id.* Indeed, Applicant has only recently been issued what he understand is the world's first permit, from the Department of Health and Environmental Control of the state of South Carolina, to permit dry cleaning operation using the claimed n-PB of the invention on a commercial scale. *Id.*

Additionally, there was no suggestion or motivation to combine the teachings of the '353 patent and Carnovale because one of ordinary skill would not have expected the method and apparatus described in Carnovale to work or function. *See, e.g.*, Second Middleton Declaration at ¶ 8. Carnovale teaches prolonged immersion of a metal cooling coil

in a tank of commercially available n-PB, which would corrode or otherwise damage the cooling coil, possibly to the extent of structural failure of the piping, causing release of hazardous air pollutants or other environmentally damaging coolant materials. *See, e.g.*, Second Middleton Declaration at ¶ 9. This is especially true if the cooling coil in Carnovale is made of galvanized steel, which is the industry standard. *Id.* One of ordinary skill in the art would not have expected that the device described in Carnovale would properly operate or even operate at all. *Id.* Therefore, there would have been no motivation to combine the use of commercially available n-PB, as taught in Carnovale, with any dry cleaning system that uses galvanized steel piping, let alone the dry cleaning system of the '353 patent. *See, e.g.*, Second Middleton Declaration at ¶ 14.

There would also have been no suggestion or motivation to combine the teachings of the '353 patent and Carnovale because one of ordinary skill in the art would not have even believed that n-PB could even be used in dry cleaning applications. *See, e.g.*, Second Declaration at ¶ 10. In fact, until June 2003, the EPA had only proposed acceptable uses for n-PB as a solvent for metal, electronics, and precision cleaning; as an aerosol solvent; and as a carrier solvent in adhesives due to the hazardous substances, e.g. certain stabilizers, contained therein. *Id.* It is believed that the EPA still accepts only these uses even today, *i.e.*, n-PB is not approved as a suitable application for dry cleaning according to the EPA.

Assuming, for the sake of argument, that a motivation existed to use n-PB, such as according to Carnovale, in the methods of the '353 patent, those of ordinary skill in the art would have immediately checked with the Material Data Safety Sheet ("MSDS") and the EPA to determine the suitability of this organic chemical. The EPA did not provide for its use in dry cleaning, and in fact, strictly regulates the commercial n-PB due to its hazardous content. *See, e.g.*, Second Declaration at ¶¶ 10 and 11. Moreover, the MSDS for commercially available n-PB clearly *teaches away* from using n-PB in dry cleaning processes such as the '353 patent. For example, an MSDS for TECHTRIDE®, a typical commercially available n-PB, states that the commercially available n-PB should not be exposed to elevated temperatures. *See, e.g.*, Second Middleton Declaration at ¶ 11. On the contrary, the '353 patent teaches that its conventional cleaning fluid, such as PERC or a hydrocarbon solvent, is distilled using two distillers during reclamation of the cleaning fluid to separate out the oils from the dry cleaning fluid (Col. 4, lines 8-22). To affect phase separation, the distillation

equipment must be able to achieve a temperature of approximately 70°C and 150°C. *Id.* As such, one of ordinary skill in the art would not have expected that the use of commercially available n-PB would have been feasible in the dry cleaning process disclosed in the '353 patent due to its elevated distillation temperature requirements. *Id.*

The MSDS for TECHTRIDE® also states that prolonged contact with metals such aluminum, magnesium, or zinc must be avoided. Specifically, the MSDS discloses that a reaction may occur during contact with aluminum fines. *Id.* The dry cleaning process of the '353 patent, however, includes the use of cleaning fluids to clean the oil-absorbent materials in dry cleaning machines, the materials containing oils as well as *metal fines* and other wastes that were not removed during the initial draining and centrifuging steps. These metal fines and other wastes are collected from the dry cleaning machine in a trap ('353 patent at Col. 4, lines 50-52). Thus, one of ordinary skill in the art would not have been motivated to use Carnovale's commercially available n-PB in a dry cleaning process because the '353 patent expressly taught that it was dangerous to do so for fear of an undesired chemical reaction.

For at least these reasons, claim 1 is not rendered obvious over the teachings of the '353 patent, in view of Carnovale.

Claims 10 and 13 are also separately patentable. Claim 10 recites a method that includes distilling the cleaning fluid so that the cleaning fluid can be reused, and claim 13 recites a method that includes distilling the cleaning fluid to remove extraneous substances therefrom. There would have been no suggestion or motivation to combine the teachings of the '353 patent and Carnovale because if commercially available n-PB, which includes certain hazardous substances as stabilizers, were used in the dry cleaning process of the '353 patent, the hazardous substances would tend to collect and buildup in the distillation equipment of the process. *See, e.g.,* Second Middleton Declaration at ¶ 12. This would be environmentally dangerous and damaging, particularly if a leak occurred. *Id.* Additionally, adherence to multiple state and federal laws regarding disposal and treatment of the hazardous substances would be required and would add to the overall cost and complexity involved with the use of commercially available n-PB. *Id.* Because of such disadvantages, one of ordinary skill in the art would not have been motivated to use commercially available n-PB as a cleaning fluid in any cleaning process that included distillation of the cleaning fluid, such as described in the

'353 patent.

For these reasons, the rejection of claims 1-20 under 35 U.S.C. § 103(a) should be reconsidered and withdrawn because no *prima facie* case of obviousness has been stated on the record as to the pending claims.

New claim 24 is also separately patentable over the '353 patent and Carnovale because Carnovale *teaches away* from storing the cleaning fluid at ambient temperature, as recited in the claim. Indeed, Carnovale teaches immersing the cooling coil in the solvent tank containing n-PB to keep it at a temperature between 0°C and -20°C and limit the evaporation of n-PB while in the solvent tank. *See, e.g.*, Carnovale at ¶¶ [0014] and [0022]. As such, claim 24 is not obvious over the '353 patent, in view of Carnovale.

New claim 25 is also separately patentable because there would have been no motivation to combine the teachings of the '353 patent and Carnovale to achieve the method of claim 25. As previously discussed, the standard in the dry cleaning industry is to use galvanized steel piping in dry cleaning systems, and commercially available n-propyl bromide is extremely corrosive to galvanized steel. In contrast, the closed loop system recited in claim 25 includes at least one pneumatic device comprising stainless steel to facilitate circulation of the cleaning fluid. Advantageously, stainless steel does not corrode when exposed to n-PB. Furthermore, neither the '353 patent nor Carnovale teaches or suggests the use of stainless steel in a cleaning system, and it would not have been obvious to use stainless steel over galvanized steel due to the increased costs associated therewith. Therefore, claim 25 is also not obvious over the '353 patent in view of Carnovale, and is patentable on its own merit.

Claims 1, 2, 5-15, and 18-20 were also rejected for obviousness-type double patenting over claims 1-10 of Applicant's own U.S. Patent No. 6,563,061 ("the '061 patent"), in view of Carnovale, on page 2 of the Office Action. The '061 patent is a continuation of the '353 patent. For the reasons previously discussed, the pending claims are not rendered obvious in view of the '061 patent. Moreover, there was no motivation to combine the '061 patent with Carnovale, and no reasonable expectation of success in achieving the claimed invention even if the cited references were combined, as previously discussed. Lastly, as discussed above and in the Second Middleton Declaration submitted herewith, the claimed invention could not have been presented at the time of filing the priority document for the '061 patent because Applicant was unaware of the claimed cleaning fluid or its properties

until he later conducted experimentation and discovered its beneficial use in dry cleaning applications. As such, Applicant respectfully requests that the double patenting rejection over the claims of the '061 patent in combination with Carnovale be withdrawn.

It is believed that the entire application is presently in condition for allowance. Should any issues remain, a personal or telephonic interview is respectfully requested to discuss the same in order to expedite the allowance of the application.

Respectfully submitted,

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Date

Jeffrey A. Wolfson
Jeffrey A. Wolfson (Reg. No. 42,234)

WINSTON & STRAWN LLP
Customer No.: 28765

(202) 282-5770